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Image recorder for car accident

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The traffic accident image recorder for automobile is characterized by that it includes CPU circuit, latch circuit, static storage circuit, electronic storage circuit, interface circuit, key circuit, clock circuit, digital camera head and trigger sensor group. The signal sensed by trigger sensor group and image signal taken by digital code camera head are fed into CPU circuit, and the image signal output by CPU circuit is passed through latch circuit, buffered and fed into static storage, and the image signal output by static storage is processed by CPU circuit and stored in electronic storage circuit, and the signal output by CPU circuit can be passed through interface circuit, and transferred into external image data collector. Said invention can provide true image of traffic accident and reliable basis for analyzing said accident.

Les données sont fournies par la banque de données **esp@cenet** - Worldwide

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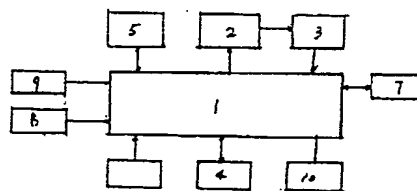
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[54] 发明名称 汽车事故图像记录器

[57] 摘要

一种汽车事故图像记录器,其特征在于:包括有中央处理电路、锁存电路、静态存储电路、电子存储电路、接口电路、按键电路、时钟电路、数码摄像头、触发传感器组,触发传感器组感应到的信号以及数码摄像头摄到的图像信号都送到中央处理电路,中央处理电路输出的图像信号经锁存电路缓冲后送到静态存储器中,从静态存储器中输出的图像信号经中央处理电路处理后可转存到电子存储电路,中央处理电路输出的信号可通过接口电路送到外部图像数据采集器。本发明可为有关部门提供车辆事故发生前后一段时间的真实图像,为事故的分析判断提供真实可靠的依据。



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1、一种汽车事故图像记录器，其特征在于：包括有中央处理电路（1）、锁存电路（2）、静态存储电路（3）、电子存储电路（4）、接口电路（5）、按键电路（6）、时钟电路（7）、数码摄像头（8）、触发传感器组（9），触发传感器组（9）感应到的信号以及数码摄像头（8）摄到的图像信号都送到中央处理电路（1），中央处理电路（1）输出的图像信号经锁存电路（2）缓冲后送到静态存储器（3）中，从静态存储器（3）中输出的图像信号经中央处理电路（1）处理后可转存到电子存储电路（4），中央处理电路（1）输出的信号可通过接口电路（5）送到外部图像数据采集器。

2、根据权利要求1所述的记录器，其特征在于：中央处理器电路（1）还可与显示器模组（10）连接。

3、根据权利要求1所述的记录器，其特征在于：触发传感器组（9）包括气囊传感器（9-1）、撞击传感器（9-2）、事故灯开关传感器（9-3）、启动传感器（9-4）。

4、根据权利要求1或2所述的记录器，其特征在于：气囊传感器（9-1）装于汽车安全气囊的出口处，撞击传感器（9-2）装于汽车靠近车头位置，事故灯开关传感器（9-3）装于汽车事故灯开关处，启动传感器（9-4）装于汽车启动开关上。

5、根据权利要求1或2所述的记录器，其特征在于：中央处理电路（1）中集成电路A1的64~71脚、72~79脚分别与锁存电路（2）中集成电路A2的1~8脚、集成电路A3的1~8脚相接，A2的9~16脚及A3的9~16脚与静态存储电路（3）中集成电路A4的2~11脚及34~42脚相接，A1的56~63脚分别与A4的15~22脚以及电子存储电路（4）中集成电路A5的29~36脚、集成电路A6的29~36脚相接，数码摄像头（8）与A1的3~5脚相接，气囊传感器（9-1）与A1的26脚相接，撞击传感器（9-2）与A1的29脚相接，事故灯开关传感器（9-3）与A1的27、28脚相接，启动传感器（9-4）与A1的30、31脚相接。

6、根据权利要求1所述的记录器，其特征在于：集成电路A1

的型号为 UPD78F4216, A2、A3 的型号为 74HCT373, A4 的型号为 HY628400, A5、A6 的型号为 HY29F800, 时钟集成电路 A10 的型号为 PCF8593。

汽车事故图像记录器

本发明涉及一种记录器，特别是一种汽车事故图像记录器。

目前汽车发生事故时，还没有一种能用图像可靠地记录下事故发生前后短时间内车辆行驶状况的仪器，使交通部门、保险公司、司法机关处理事故时会有一定的困难。

本发明的目的在于提供一种可直观监测车辆事故发生前后一段时间的真实图像，为事故的分析判断提供真实、可靠依据的汽车事故图像记录器。

本发明的目的可以通过以下措施来达到：本发明包括有中央处理电路、锁存电路、静态存储电路、电子存储电路、接口电路、按键电路、时钟电路、数码摄像头、触发传感器组，触发传感器组感应到的信号以及数码摄像头摄到的图像信号都送到中央处理电路，中央处理电路输出的图像信号经锁存电路缓冲后送到静态存储器中，从静态存储器中输出的图像信号经中央处理电路处理后可转存到电子存储电路，中央处理电路输出的信号可通过接口电路送到外部图像数据采集器。

本发明的目的还可以通过以下措施来达到：中央处理器电路还可与显示器模组连接。触发传感器组包括气囊传感器、撞击传感器、事故灯开关传感器、启动传感器。气囊传感器装于汽车安全气囊的出口处，撞击传感器装于汽车靠近车头位置，事故灯开关传感器装于汽车事故灯开关处，启动传感器装于汽车启动开关上。中央处理电路中集成电路 A1 的 64~71 脚、72~79 脚分别与锁存电路中集成电路 A2 的 1~8 脚、集成电路 A3 的 1~8 脚相接，A2 的 9~16 脚及 A3 的 9~16 脚与静态存储电路中集成电路 A4 的 2~11 脚及 34~42 脚相接，A1 的 56~63 脚分别与 A4 的 15~22 脚以及电子存储电路中集成电路 A5 的 29~36 脚、集成电路 A6 的 29~36 脚相接，数码摄像头与 A1 的 3~5 脚相接，气囊传感器与 A1 的 26 脚相接，撞击传感器与 A1 的 29 脚相接，事故灯开关传感器与 A1 的 27、28 脚相接，启动传

传感器与 A1 的 30、31 脚相接。集成电路 A1 的型号为 UPD78F4216, A2、A3 的型号为 74HCT373, A4 的型号为 HY628400, A5、A6 的型号为 HY29F800, 时钟集成电路 A10 的型号为 PCF8593。

本发明相比现有技术具有如下优点:

1、采用撞击传感器、气囊传感器或按下事故灯来锁定事故发生前后汽车的行驶情况, 并采用先进的数码摄像技术摄取图像, 采用先进的大容量不易失电子存储器存储图像, 整个装置由单片机控制, 简单可靠, 可为有关部门提供车辆事故发生前后一段时间的真实图像, 为事故的分析判断提供真实可靠的依据。

2、设计合理, 安装方便, 实用可靠, 体积小、重量轻, 易于推广实施, 适合于各种车辆使用。

图 1 为本发明的原理方框图;

图 2、图 3 为本发明各传感器装于汽车上的结构示意图;

图 4 为本发明的电路原理图。

本发明下面将结合附图(实施例)作进一步详述:

参照图 1, 本发明包括中央处理电路 1、锁存电路 2、静态存储电路 3、电子存储电路 4、接口电路 5、按键电路 6、时钟电路 7、数码摄像头 8、触发传感器组 9、显示器模组 10 等。

参照图 2、图 3, 触发传感器组 9 包括气囊传感器 9-1、撞击传感器 9-2、事故灯开关传感器 9-3、启动传感器 9-4。气囊传感器 9-1 装于汽车安全气囊的出口处, 一旦发生事故, 气囊会迅速张开, 触动气囊传感器 9-1。撞击传感器 9-2 装于汽车靠近车头的地方, 一旦发生较激烈的碰撞事故, 撞击传感器 9-2 迅速触发。事故灯开关传感器 9-3 装于汽车事故灯开关处, 如发生轻微的碰撞事故, 气囊传感器 9-1 及撞击传感器 9-2 都不会动作, 这时需按下事故灯开关, 则事故灯开关传感器 9-3 动作, 启动图像及时转存。启动传感器 9-4 装于汽车启动开关上, 只要启动汽车, 则通过传感器 9-4 启动整个系统工作。数码摄像头 8 装于汽车驾驶室内靠近车头处, 方便实时摄取图像。

参照图4，中央处理器电路1包括集成电路A1（型号UPD78F4216）等；锁存电路2包括集成电路A2、A3（型号74HCT373）等；静态存储电路3包括集成电路A4（型号HY628400）等；电子存储电路4包括集成电路A5、A6（型号HY29F800）等；接口电路5为USB接口；按键电路6包括图像输出按钮K1、图像清除按钮K2等；时钟电路7包括集成电路A10（型号PCF8593）等；A10的7~9脚与A1的45~47脚相接；显示器模组10为液晶显示器，其1~9脚与A1的P1~P10脚相接，可显示时间等信息。

实际使用时，启动汽车，触发传感器9-4，使记录器工作，由单片机A1控制数码摄像头8实时摄取图像，由锁存器A2、A3缓冲后预存在静态存储器A4中；并由单片机A1控制定时刷新（定时由时钟电路A10提供）。一旦发生事故，撞击传感器9-2、气囊传感器9-1触发（或人为按下事故灯开关，事故灯开关传感器9-3触发），事故前后记录到静态存储器A4中的图像由单片机A1控制，转存到大容量不易失电子存储器A5中，同时声光报警。此时交警部门（或其它部门）可通过USB接口把外接图像数据采集器接上，只要按下图像输出按钮K1，则可在外接图像显示器中显示事故发生前后一段时间（如30秒~60秒）汽车的行驶情况。存储器A5、A6也可为插卡形式，发生事故后由有关部门取出插卡芯片在显示器播放。本记录器采用两级存储器A5、A6，可以记录两次事故发生的实时图像，可以用于在事故车辆驶离事故现场前住处理点的途中再次发生事故的记录。当事故处理完毕后，可按下图像清除开关K2，清除A5、A6中存储的图像。如图像转存为意外触发，并非事故发生，也可人为按下图像清除开关K2，清除存储图像。

00:10:09

说明书附图

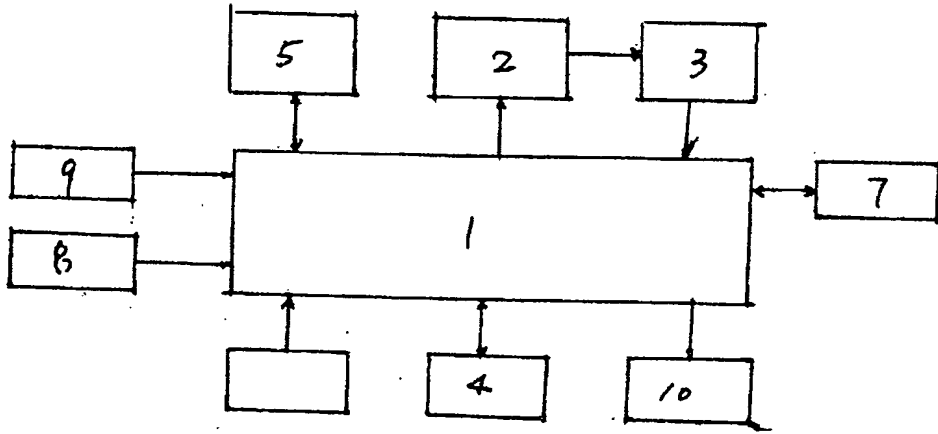


图1

00.10.09

说明书附图

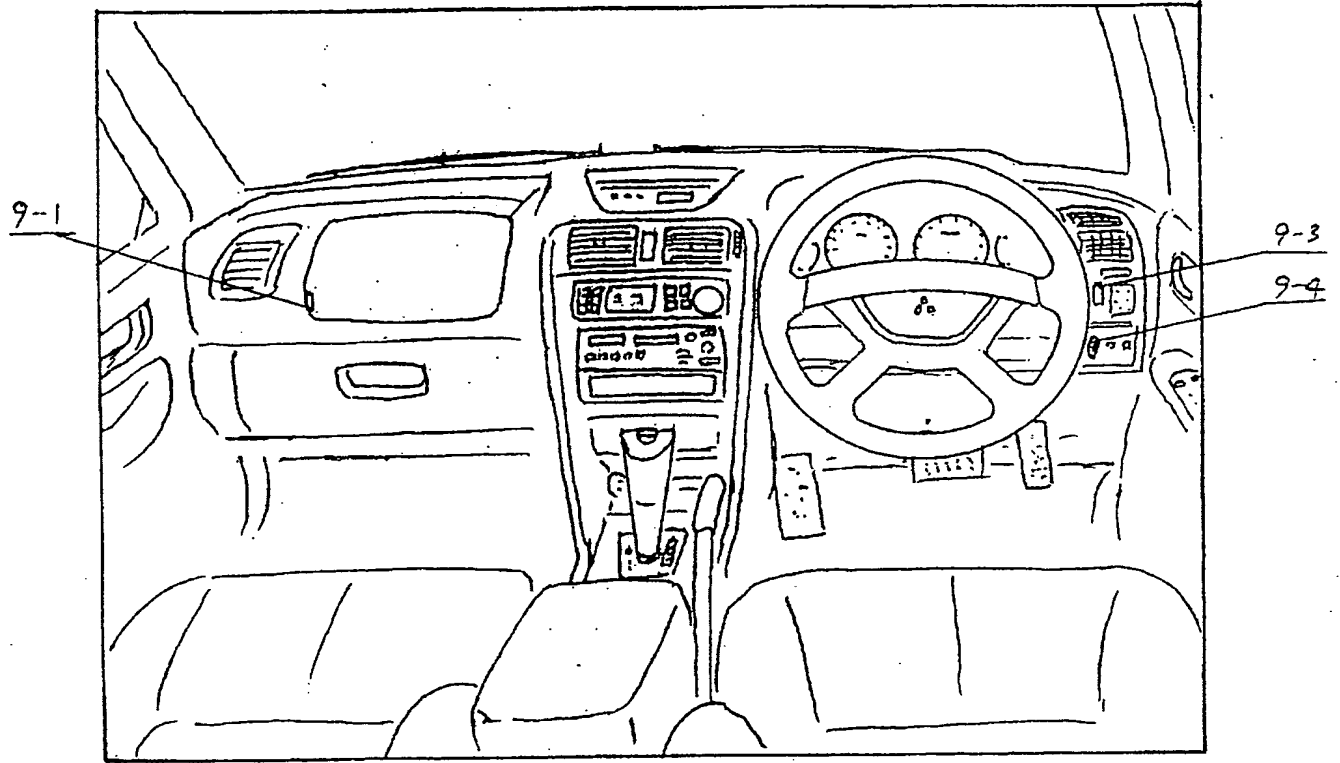


图2

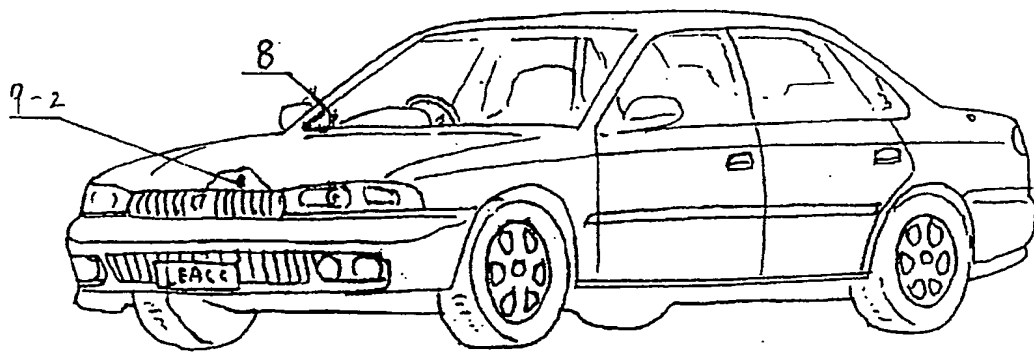


图3

00.10.00

说明书附图

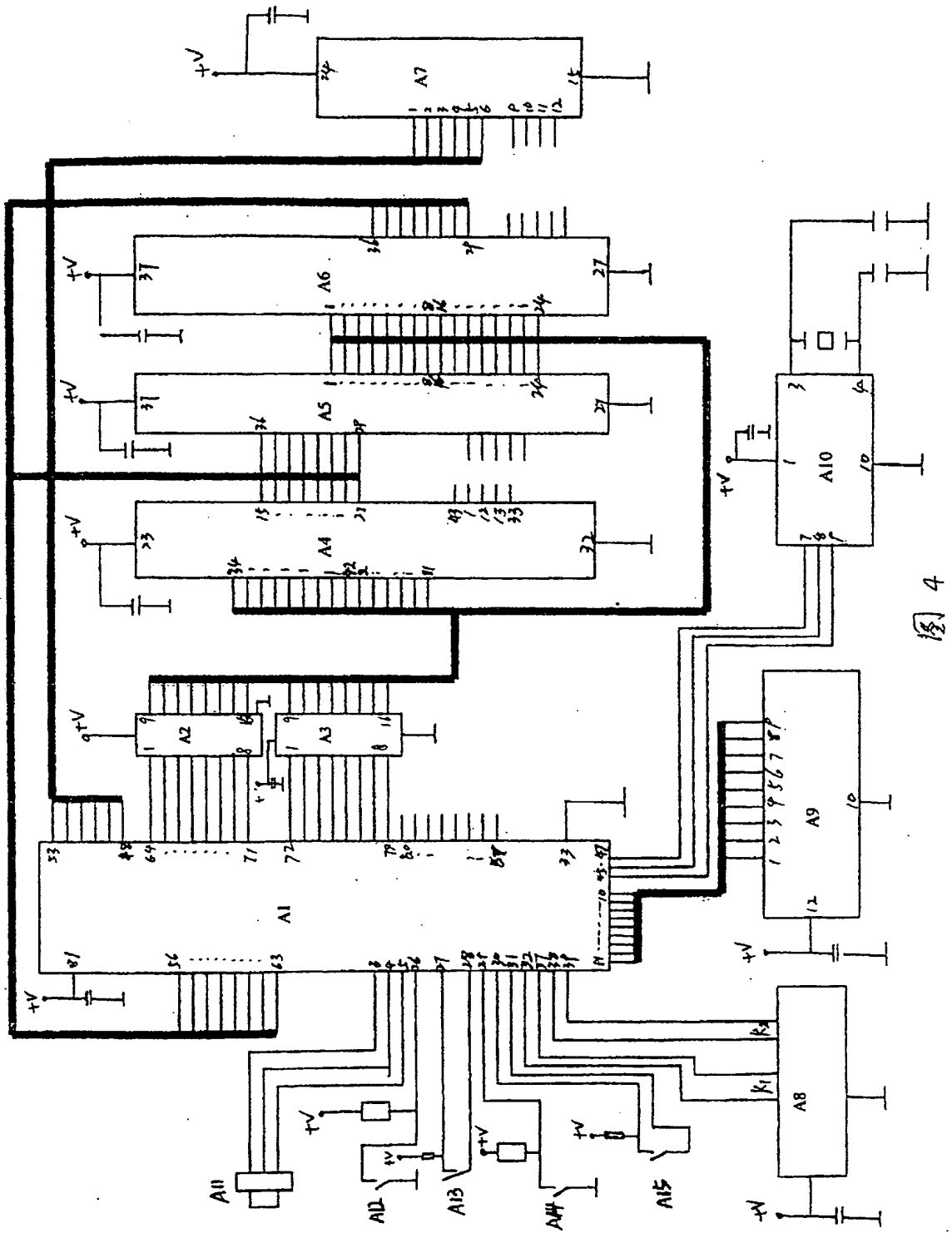


图 4

Traffic Accident Image Recorder for Automobile

Field of the Invention

The present invention relates to a recorder, and more particularly to a traffic accident image recorder for automobile.

Description of the Related Art

At present, in the case of having a traffic accident, there is no device capable of recording reliably vehicle travelling data during a short period before and after the accident as image, which makes the settlement of the traffic accident difficulty for traffic management division, insurance corporations and department of justice.

Summary of the Invention

The present invention aims to provide a traffic accident image recorder for automobile capable of directly monitoring true image during a period before and after an accident happens, and providing a reliable basis for analyzing the accident.

The object of the present invention can be attained by a traffic accident image recorder comprising CPU circuit, latch circuit, static storage circuit, electronic storage circuit, interface circuit, key circuit, clock circuit, digital camera head and trigger sensor group, wherein the signal sensed by the trigger sensor group and the image signal taken by the digital camera head are fed into the CPU circuit, the image signal output by the CPU circuit is fed into the static storage after being buffered by the latch circuit, the image signal output by the static storage is processed by the CPU circuit and stored in the electronic storage circuit, and the signal output by the CPU circuit is passed via the interface circuit and transferred into an external image data collector.

The object of the present invention can be attained by the CPU circuit further being connected to a displayer module. The trigger sensor group is comprised of airbag sensor, crash sensor, accident light switch sensor and start sensor. The airbag sensor is provided at an outlet for the automobile airbag. The crash sensor is provided close to the automobile front position. The accident light switch sensor is provided at an accident light switch. The start sensor is provided at a start switch for the automobile. Pins numbered 64-71 and 72-79 of integrated circuit A1 in the CPU circuit are connected to pins numbered 1-8 of integrated circuit A2 and pins numbered 1-8 of integrated circuit A3 in the latch circuit, respectively. Pins numbered 9-16 of the integrated circuit A2 and pins numbered 9-16 of the integrated circuit A3 are connected to pins numbered 2-11 and 34-42 of integrated circuit A4 in the static

storage circuit. Pins numbered 56-63 of the integrated circuit A1 are connect to pins numbered 15-22 of the integrated circuit A4 and pins numbered 29-36 of integrated circuit A5, and pins numbered 29-36 of integrated circuit A6 in the electronic storage circuit, respectively. The digital camera head is connected to pins numbered 3-5 of A1. The airbag sensor is connected to pin numbered 26 of A1. The crash sensor is connected to pin numbered 29 of A1. The accident light switch sensor is connected to pins numbered 27 and 28 of A1. The start sensor is connected to pins numbered 30 and 31 of A1. Model number of the integrated circuit A1 is UPD78F4216. Model number of each of A2 and A3 is 74HCT373. Model number of A4 is HY628400. Model number of each of A5 and A6 is HY29F800. Model number of a clock integrated circuit A10 is PCF8593.

The present invention has advantages over the related art as follows:

1. The vehicle travelling data before and after the accident happens is determined by using the crash sensor and the airbag sensor or by pressing the accident light. In addition, an advanced digital photography is used to pick up image, and an advanced non-volatile electronic memory of mass storage is used to store image. The device is controlled overall by a single-chip computer easily and reliably, and can provide true image during a period before and after an accident happens and a reliable basis for analyzing the accident.
2. The recorder of the present invention is characterized by being reasonably designed, conveniently mounted, and reliably operated. The recorder is of low volume, light, easy to implement, and suitable for various vehicle applications.

Brief Description of the Drawings

FIG. 1 is a block diagram explaining the principle of the present invention;

FIG. 2 and FIG. 3 are schematic structure views of a plurality of sensors when being mounted in an automobile; and

FIG. 4 is a schematic circuit diagram of the present invention.

Detailed Description of the Preferred Embodiments

The present invention will be further described in detail now with reference to the accompanying drawings (embodiments).

With reference to FIG. 1, the recorder of the present invention includes CPU circuit 1, latch circuit 2, static storage circuit 3, electronic storage circuit 4, interface circuit 5, key circuit 6, clock circuit 7, digital camera head 8, trigger sensor group 9, displayer module 10, etc.

With reference to Figs. 2 and 3, the trigger sensor group 9 is comprised of airbag sensor 9-1, crash sensor 9-2, accident light switch sensor 9-3, and start sensor 9-4. The airbag sensor 9-1 is provided at an outlet for the automobile airbag. Once an accident happens, the airbag will expand quickly, triggering the airbag sensor 9-1. The crash sensor 9-2 is provided close to the automobile front position. Once a severe crash happens, the crash sensor 9-2 is triggered quickly. The accident light switch sensor 9-3 is provided at an accident light switch. In the case of a mild crash, neither the airbag sensor 9-1 nor the crash sensor 9-2 act, and at this time the accident light is pressed, then the accident light switch sensor 9-3 actuates to store image in time. The start sensor 9-4 is provided at a start switch for the automobile. The whole system is started by the sensor 9-4 when the automobile is started. The digital camera head 8 is provided in the driver room with being close to the automobile front position, so that the image is picked up in real time.

With reference to FIG. 4, the CPU circuit 1 includes an integrated circuit A1 (Model number: UPD78F4216), etc.; the latch circuit 2 includes integrated circuits A2, A3 (Model number: 74HCT373), etc.; the static storage circuit 3 includes an integrated circuit A4 (Model number: HY628400), etc.; the electronic storage circuit 4 includes integrated circuits A5, A6 (Model number: HY29F800), etc.; the interface circuit 5 is a USB interface; the key circuit 6 includes image output key K1, image clear key K2, etc.; the clock circuit 7 includes an integrated circuit A10 (Model number: PCF8593), etc.; pins numbered 7-9 of A10 are connected to pins numbered 45-47 of A1; the displayer module 10 is a liquid crystal displayer on which information such as time can be displayed, whose pins numbered 1-9 are connected to pins numbered P1-P10 of A1.

In the actual application, the automobile is started so that the sensor 9-4 is triggered and the recorder begins to work. The image is picked up in real time by the digital camera head 8 under the control of the single-chip computer A1, pre-stored in the static storage A4 after being buffered by the latch circuits A2 and A3, and updated under the control of the single-chip computer A1 at the timings set by the clock circuit A10. Once an accident happens, the crash sensor 9-2 and the airbag sensor 9-1 are triggered (or the accident light switch sensor 9-3 is triggered when the accident light switch is pressed by manual operation). The images recorded in the static storage A4 before and after the accident happens are controlled by the single-chip computer A1, and transferred into the non-volatile electronic memory A5 of mass storage while warning in the form of sound and light. At that time, traffic management division (or other divisions) can connect an external image data collector to the recorder via USB interface and press the image output key K1, then the vehicle travelling data during a period (of 30-60 seconds, for example) before and after the accident happens can be displayed on the external image displayer. The storages A5 and A6 further can take the form of slot, so that related division can take slot chip out to play on the displayer after the accident. Since the recorder of the present invention utilizes two-stage storages A5 and A6, the true images of two accidents can be recorded so that the

further accident of the vehicle in question in the way to settlement point away from the accident field can be recorded. When the accident is settled, the image clear key K2 can be pressed so that the images stored in A5 and A6 are cleared. If the image transferring is triggered by incaution, rather by an accident, the image clear key K2 can be pressed by manual operation to clear stored images.

WHAT IS CLAIMED IS:

1. A traffic accident image recorder, characterized by comprising CPU circuit (1), latch circuit (2), static storage circuit (3), electronic storage circuit (4), interface circuit (5), key circuit (6), clock circuit (7), digital camera head (8) and trigger sensor group (9), wherein the signal sensed by the trigger sensor group (9) and the image signal taken by the digital camera head (8) are fed into the CPU circuit (1), the image signal output by the CPU circuit (1) is passed through the latch circuit (2), buffered and fed into the static storage (3), the image signal output by the static storage (3) is processed by the CPU circuit (1) and stored in the electronic storage circuit (4), and the signal output by the CPU circuit (1) can be passed through the interface circuit (5), and transferred into an external image data collector.
2. The recorder according to claim 1, characterized in that the CPU circuit (1) is further connected to a displayer module (10).
3. The recorder according to claim 1, characterized in that the trigger sensor group (9) is comprised of airbag sensor (9-1), crash sensor (9-2), accident light switch sensor (9-3) and start sensor (9-4).
4. The recorder according to claim 1 or 2, characterized in that the airbag sensor (9-1) is provided at an outlet for the automobile airbag, the crash sensor (9-2) is provided close to the automobile front position, the accident light switch sensor (9-3) is provided at an accident light switch, and the start sensor (9-4) is provided at a start switch for the automobile.
5. The recorder according to claim 1 or 2, characterized in that pins numbered 64-71 and 72-79 of integrated circuit A1 in the CPU circuit (1) are connected to pins numbered 1-8 of integrated circuit A2 and pins numbered 1-8 of integrated circuit A3 in the latch circuit (2) respectively, pins numbered 9-16 of the integrated circuit A2 and pins numbered 9-16 of the integrated circuit A3 are connected to pins numbered 2-11 and 34-42 of integrated circuit A4 in the static storage circuit (3), pins numbered 56-63 of the integrated circuit A1 are connect to pins numbered 15-22 of the integrated circuit A4, and pins numbered 29-36 of integrated circuit A5 and pins numbered 29-36 of integrated circuit A6 in the electronic storage circuit (4) respectively, the digital camera head (8) is connected to pins numbered 3-5 of A1, the airbag sensor (9-1) is connected to pin numbered 26 of A1, the crash sensor (9-2) is connected to pin numbered 29 of A1, the accident light switch sensor (9-3) is connected to pins numbered 27 and 28 of A1, and the start sensor (9-4) is connected to pins numbered 30 and 31 of A1.
6. The recorder according to claim 1, characterized in that model number of the integrated circuit A1 is UPD78F4216, model number of each of A2 and A3 is

74HCT373, model number of A4 is HY628400, model number of each of A5 and A6 is HY29F800, and model number of a clock integrated circuit A10 is PCF8593.

Abstract

The traffic accident image recorder for automobile is characterized by that it includes CPU circuit, latch circuit, static storage circuit, electronic storage circuit, interface circuit, key circuit, clock circuit, digital camera head and trigger sensor group. The signal sensed by trigger sensor group and image signal taken by digital camera head are fed into CPU circuit, and the image signal output by CPU circuit is passed through latch circuit, buffered and fed into static storage, and the image signal output by static storage is processed by CPU circuit and stored in electronic storage circuit, and the signal output by CPU circuit can be passed through interface circuit, and transferred into external image data collector. Said invention can provide true image of traffic accident and reliable basis for analyzing said accident.